Applicant #:_____
Question # __I____

Answer on these pages, tear from the booklet and submit with the answer packet if you chose Option A for Part I of this examination.

Professional Foresters Registration Examination, October, 2018

PART I

Instructions: APPLICANTS, PLEASE READ THESE INSTRUCTIONS CAREFULLY. You MAY complete PART I by doing ONE of the following two options:

A) Complete the Short Answer Section (Question 1) and Any Two (2) of the Essay Questions (Questions II through V)

OR

B) Complete Any Three of the Essay Questions (Questions II through V) and OMIT answering the Short Answer Question (Question I).

Question II - Forest Mensuration
Question III - Forest Ecology
Question IV-Silviculture
Question V - Forest Protection

Professional Foresters Registration
1416 9th Street, Room 1506-16
Sacramento, CA 95814

Applicant #:_____
Question # __I_____

Answer on these pages, tear from the booklet and submit with the answer packet if you chose Option A for Part I of this examination.

ACRONYMS AND ABBREVIATIONS USED IN THIS EXAMINATION

The following Acronyms and /or Abbreviations **may be used** in this examination.
Technical abbreviations that should be known by a forester are NOT included here (e.g. DBH, MAI, MBF). You may remove this page for reference throughout this examination. **It need not be returned.**

Acronym or Abbreviation	Full Text
BLM	Bureau of Land Management, USDI
BOF	California State Board of Forestry and Fire Protection
CA	California
CCR	California Code of Regulations
CAL FIRE	California Dept. of Forestry and Fire Protection
CDF&W	California Department of Fish and Wildlife
FPR	California Forest Practice Rules
PRC	California Public Resources Code
RPF	California Registered Professional Forester
THP	California Timber Harvest Plan
TPZ	California Timber Production Zone
USFS	United States Forest Service, USDA

FA=Forest Admin, FE=Forest Ecology, FEng= Forest Engineering, FEcon= Forest Economics, FM= Forest Management, FPol= Forest Policy, FP= Forest Protection, FMens = Forest Mensuration, FS=Silviculture

Applicant #:_____
Question # __I____

Answer on these pages, tear from the booklet and submit with the answer packet if you chose Option A for Part I of this examination.

OCTOBER 2018 RPF EXAMINATION

3% 1. When an alien or exotic species can establish, grow, reproduce, and maintain itself in an area where it did not originally grow, it is said to be:

_____

3% 2. Define Carbon Sequestration.

_____

_____

3% 3. Typically, riparian vegetation is more important as a source of energy "inputs" in the headwaters areas of California and other western U.S. rivers than towards the lower end. Briefly explain why.

_____

_____

4% 4. List two (2) types of fixed costs and two (2) types of variable costs generally incurred by Licensed Timber Operators in harvesting operations

_____

_____

3% 5. Define the economic term “Externality”.

_____

_____

CONTINUED NEXT PAGE

Answer on these pages, tear from the booklet and submit with the answer packet if you chose Option A for Part I of this examination.

3% 6. What characteristic of true fir requires that special attention be paid to during partial cutting?

_____

3% 7. For northern California, list three (3) salmonids that have been placed on the Federally Threatened or Endangered list. Give either the common or scientific names. (Northern California is commonly defined as that geographic region north of the Tehachapi Mountains.)

_____

_____

3% 8. You have been doing THP fieldwork near a lake following a strong windstorm. You find a very large bird nest on the ground near a clump of recently downed tall snags. The nest is comprised of large to small sticks and contains a variety of odd items (tin cans bottles, rope, shells) and three oval broken pinkish-white eggs about 2 inches long. What have you likely found?

_____

3% 9. *Armillaria mellea* (oak root rot) is endemic in California. What are three (3) ways by which you can decrease the prevalence of this problem in a managed forest setting?

_____

Continued Next Page

Answer on these pages, tear from the booklet and submit with the answer packet if you chose Option A for Part I of this examination.

3% 10. As used in forest archaeology, describe a characteristic that will indicate whether something you find in the forest might be a chipped stone tool or flake made by prehistoric people thus warrant disclosure.

_____

3% 11. Under the Forest Practice Act regulations governing "nonindustrial timberland", list three (3) characteristics which define a “nonindustrial” tree farmer.

_____

3% 12. Define the term "Agroforestry".

_____

3% 13. According to the CCR, an approach to harvesting based on the retention of structural elements or biological legacies (trees, snags, logs, etc.) from the pre-harvest stand for integration into the post-harvest stand to achieve various ecological, social and geomorphic objectives is called:

_____.

3% 14. Currently, what is the status of the California’s Forest Practice Rules (FPRs) as BMPs under Section 208 of the Federal “Clean Water Act”?

Continued Next Page

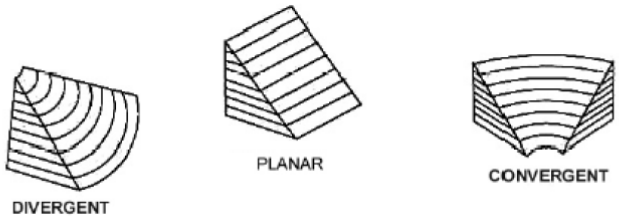
Answer on these pages, tear from the booklet and submit with the answer packet if you chose Option A for Part I of this examination.

3% 15 As applied to the growth of an even-aged stand of trees, which parameter peaks first, the volumetric MAI or the volumetric PAI?

3% 16. Define BI or Burning Index as it is used in Fire management.

3% 17. What is a genetically improved tree?

3% 18. According to the Forest Practice Rules (technical addendum # 5), which of these three major slope forms is most stable: Planar, Divergent or Convergent?



SLOPE FORMS

3% 19. As used in Mensuration, what is the "coefficient of variation" used to measure?

Continued Next Page

Answer on these pages, tear from the booklet and submit with the answer packet if you chose Option A for Part I of this examination.

3% 20. In performing a Stocking Survey for a plantation area, you lay out a uniform grid as prescribed and sample 80 plots. One plot fell in an unregenerated landing. What would be the minimum number of stocked plots needed to find the area in a stocked status, according to the CA forest practice rules? Show your work.

3% 21. As used in Silviculture, what is a Free Thinning?

3% 22. A 25-ton load of fresh wood chips is delivered to a biomass co-generation facility. The load of chips has moisture content of 45%. How many dry weight tons in the load of chips? Please show your work.

3% 23. What is the basal area of a 14-inch DBH tree in square feet? Please show your work.

3% 24. What is "Discounted cash flow"? What is its utility for managerial decisions?

CONTINUED NEXT PAGE

Answer on these pages, tear from the booklet and submit with the answer packet if you chose Option A for Part I of this examination.

3% 25. Define Avulsion as used in fluvial geomorphology and the FPRs.

3% 26. How many square feet in an acre?

3% 27. How do the Forest Practice Rules define "economic feasibility"?

3% 28. List three (3) reasons why seed tree and shelterwood systems are generally not used to regenerate redwood stands.

3% 29. As defined in the CA FPRs, what is a Deactivated Road?

3% 30. Explain how stream "ordering" works in a large watershed (it is a system that compares streams within and among watersheds, e.g.-Strahler System)

CONTINUED NEXT PAGE

Answer on these pages, tear from the booklet and submit with the answer packet if you chose Option A for Part I of this examination.

3% 31. Anthropogenic effects on global climate include cultural practices associated with agriculture and livestock, clearing and burning of forests, and burning fossil fuels each of which in turn elevate carbon dioxide and methane far above natural levels. Describe the effect of increased carbon dioxide on forest growth.

3% 32. In Forest Management (Genetics), what is Resilience?

3% 33. What California law requires forest practice regulations to address archeological resources?

END OF QUESTION # I AND ANSWERS

QUESTION II - FOREST MENSURATION

OBJECTIVE

To demonstrate your ability to analyze various forest conditions and situations to design and conduct an appropriate cruise.

SITUATION

A client retains you to cruise three separate tracts of timber she owns. She is interested in the volume of net merchantable timber on each tract. The tracts are described below. The client's purpose and her general instructions are also shown for each tract. For all tracts, assume that 1) there is no effect of recovery of value based on forest practice or other environmental regulations and 2) all tracts have nearly the same degree of reasonable access.

Tract I

SIZE: 640 acres

LOCATION: Trinity County, California

TYPE OF TIMBER: Contains larger second-growth and old-growth ponderosa and sugar pine, white fir, and associated conifers over entire area.

BOUNDARIES: No information available from client.

CRUISE PURPOSE: For client's use in estimation of minimum acceptable value. Timber to be offered for sale on a per species stumpage basis at public sealed bid and sold for highest bid from a responsible bidder (provided minimum is met or exceeded).

RESTRICTIONS ON INTENSITY, TIME, CONSTRAINTS, OR COST OF CRUISE: Client requests that cruise intensity be adequate to protect her from setting a minimum acceptable bid which would be either too low or too high, but, cannot afford an intensive cruise. Cruise is to be completed within two months.

Tract II

SIZE: 40 acres

LOCATION: Del Norte County, California

TYPE OF TIMBER: Moderately dense stand of virgin old-growth redwood over entire area.

BOUNDARIES: Blazed, flagged, and K-tagged lines marked by a recent recorded survey by a licensed land surveyor retained by client.

CRUISE PURPOSE: For use in court to support client's claim of substantially higher values than offered by a condemning public agency.

RESTRICTIONS ON INTENSITY, TIME CONSTRAINTS, OR COST OF CRUISE: None

CONTINUED NEXT PAGE

Tract III

SIZE: 6,400 acres

LOCATION: Placer County, California

TYPE OF TIMBER: Scattered, older residual stand of mixed conifers with patches of young growth timber left after logging in the 1960-1970s. Approximately one-third of the property is in non-timbered areas including brush-fields, rocky land, and meadows.

BOUNDARIES: No information available from client. Intermingled and adjoining large diameter timber, including some not previously logged stands, of other private and public ownership is known to exist.

CRUISE PURPOSE: For client's use in planning for future management. No timber sales contemplated soon.

RESTRICTIONS ON INTENSITY, TIME, CONSTRAINTS, OR COST OF CRUISE: Client stipulates cruise costs should be kept to the minimum needed for management planning on a general basis. Time for completion is one year. Cruise intensity to be adequate to give reasonable estimates by species for the entire property. No breakdown of cruise data by smaller subdivisions is necessary.

QUESTIONS:

Answer the following questions for **EACH** tract:

60% 1. Briefly describe the type of cruise you would recommend. Justify the cruise intensity, layout, and what measurements are needed. Also state what additional resources or sources of information that should be provided to you or you would procure to accomplish the cruise. Include your reasons for selecting that type of cruise over the alternatives.

15% 2. Explain what field tools/instruments and procedures you would use during the cruise to obtain the measurements you recommended in part 1, above.

10% 3. What steps would you take to identify the property boundary lines?

15% 4. What sources should you use to estimate yield, defect and breakage, and log grade information for this cruise.

END OF QUESTION

QUESTION III-FOREST ECOLOGY

OBJECTIVE:

To demonstrate understanding of forest restoration and sustainability principles and their application to managed stands under influence of climate change.

SETTING:

Understanding the impacts of climate change on forest structure, composition and function is crucial for conservation and management of forest resources. Our natural climate has oscillated simultaneously at multiple and nested temporal scales, including interannual, decadal, century, millennial, and multimillennial periods.

The phrase global climate change is sometimes conflated with global warming, anthropogenic greenhouse gas impacts and politics. There is, however, a larger context that affects issues of forest sustainability and restoration ecology—that is, the role of the natural climate system as a pervasive force of ecological change.

QUESTIONS:

10% 1. Changes in weather are familiar features of Earth's surface, readily recognizable as diurnal variations, seasonal cycles, and annual differences. All forms of life are influenced by this variability in how and where they live.

Explain how drought, heat and cold limit the distribution of Coast Redwood.

10% 2. What would happen to the distribution of Coast Redwood if the Pacific Ocean warmed and fog distributions patterns changed?

10% 3. Quaternary (last 2.5 mm yBP (years before present time)) climates were variable and complex revealing a repeating pattern of many ~100,000 year glacial/interglacial cycles. Natural global temperature differences between glacial and interglacial periods averaged 10 - 20°C, often requiring over 20,000 years to completely warm thus along term average increase of < 0.1 degrees per century.

Briefly compare the effect on Western USA forest vegetation of these natural changes with what might occur if the current rate of ~1+°C increase per century accelerates due to anthropogenic effects.

10% 4. What is the primary cause of glacial to interglacial natural (not anthropogenic) global climate change?

10% 5. Multiple century scale Natural Climate Cycles are called "Bond cycles". The last such cycle has been dubbed the "Little Ice Age", a global **cold** period from CE (current era) 1450 to 1920. Forest restoration projects in California often reference the year 1850 as "pre-settlement" thus the desired future condition to be restored.
Explain how knowledge of the "Little Ice Age" might influence this perception of "desired" future conditions.

Continued on the Next Page

15% 6. Ecological sustainability is a dominant paradigm in restoration ecology just as forest sustainability is in managed forests. Discuss the conditions that demonstrate ecological forest sustainability (note this is not simply sustained yield).

10% 7. Anthropogenic effects on global climate include cultural practices associated with agriculture and livestock, clearing and burning of forests, and burning fossil fuels each of which in turn elevate carbon dioxide and methane far above natural levels. Describe the effect of increased carbon dioxide on forest growth.

10% 8. Climatologists have documented Interannual scale natural Climate Change. The best known of these cycles is the El Niño pattern, called the El Niño-Southern Oscillation (ENSO).

The reverse effect is dubbed La Niña which brings unusually warm and dry falls and winters in central and southern California.

What might be the effects of a decade of unusually warm and dry La Niña on Central and Southern California forests?

15% 9. At ~ 1000 meters elevation, the lower edge of the "Yellow Pine Belt" (dominated by *Pinus ponderosa*) in central California has retreated upslope about 526 meters since 1850. Grazing, competition by nonnative grasses, urbanization, and fire occurred on only 42% of the total area of change.

Due to temperature rebound following the "Little Ice Age" and greenhouse gases, the monthly minimum temperatures in the middle-elevation central Sierra Nevada Mountains have increased over the past 100 years by about 3°C.

How might this temperature increase have influenced the shift in Pine vegetation?

End of Question and Answer

QUESTION IV FOREST SILVICULTURE

OBJECTIVE:
To demonstrate understanding of forest site quality and effectively determine them.

SETTING:
The timberland of California. Understanding site quality and the various site indexes available is critical to their use in field and planning applications.

QUESTIONS:

9% 1. What is a forest site index?

12% 2. What are four (4) uses of site indexes in forestry?

10% 3. What are two (2) of the three site index systems used in the FPRs?

10% 4. For one (1) of the three site index systems used in the FPRs, describe in what types of forest composition the FPRs intend their use.

10% 5. Discuss the general use of tree age in California site index systems. Include in your discussion how tree age measurement (total age vs DBH age) may affect the ability of site index to predict future height growth.

14% 6. Many field foresters have some subjective notion of what constitutes a generic site tree. Discuss how this generic notion compares to specific site tree selection required in California site indexes. Include a discussion of the general selection criteria for site trees: crown position, tree size, age, deformities and the specific requirements of the site index being used. Explain why these characteristics are important for predicting future growth of a stand.

10% 7. Foresters often have difficulty in reconciling published site index systems requirements for what constitutes an appropriate site tree with data from actual plot measurements. This occurs even when actual measurements include tree height data and age estimates of some trees from increment cores. Discuss some of the limitations and subjective nature of the site tree field measurements.

15% 8. Discuss how an RPF might estimate site quality when there are no suitable site trees (or no trees) and no historical records for the stand and nearby areas. Give a practical California example.

10% 9. Assume you have site classification suitable for use in a THP (FPR referenced index). Could one apply this FPR site information to model stand development using a computer and suitable digital stand simulator? What information about your model is needed before you can use the FPR site information in your growth model? Can site information be transferred from one index to another?" If so, how?

End of Question and Answer

QUESTION V- FOREST PROTECTION

OBJECTIVE
To demonstrate your ability to identify and assess factors relevant to archeological review and protection of archeological resources.

SITUATION
A THP has been proposed on private commercial forest property in California. You are the RPF responsible for the project. Assume there is no other RPF or Professional Archaeologist available for this project. As plan RPF you are responsible for completeness and accuracy of all information in this matter even though you may employ someone else with an Archaeological Training Certificate.

QUESTIONS

30% 1. Identify and discuss the archaeological background information you will need to obtain to comply with present forest practice rules and regulations and to carry out an efficient discovery phase of the archeological review.

20% 2. Assume that you are ready to implement an archaeological survey of the project area, two survey procedures must be followed and addressed in your (or your supervised designee's) survey report; the SURVEY METHOD and the SURVEY INTENSITY. Describe and explain these important survey procedures. Give examples.

20% 3. During your field survey, a cultural site is found that must be addressed. In order to determine what mitigation measures might be necessary and to what degree the project may have an adverse effect, the California Environmental Quality Act and forest practice rules usually require that significance of the site be considered and addressed. Describe and discuss five elements of significance.

30% 4. Once significance has been considered and the project's site specific objectives evaluated, describe and explain enforceable protection measures both within the site and within 100 feet of the site boundaries.

(END OF QUESTION)

Professional Foresters Registration Examination October, 2018

Part II

Applicant Must Also <u>Answer Three</u> of the Remaining Five Essay Questions in Part II

Question VI-Forest Engineering
Question VII-Economics
Question VIII-Forest Administration
Question IX-Forest Policy
Question X-Forest Management

Professional Foresters Registration 1416 9th Street, Room 1506-16
Sacramento, CA 95814

QUESTION VI-FOREST ENGINEERING

OBJECTIVE
To demonstrate your knowledge of the Shovel Logging system and methodology.

SITUATION
Shovel logging (often called hoe-chucking in Canada) has been in use since the 1970s. It has been proven to be highly productive and economical and has become increasing utilized on settings with more difficult terrain, previously considered “cable ground”. In some companies, it has become the main method of ground-based logging.

QUESTIONS

45% 1. Describe how this logging system is A) equipped, B) techniques used, and C) operational considerations to be considered. Please draw a basic equipment diagram to support your written answer.

20% 2. Shown on the next two pages are two logging units that will be logged by shovel. Unit A is on gentle terrain (e.g. flat to 25%). Unit B is a steeper unit (e.g. up to 40-50%), but within acceptable limits for shovel logging. Draw a typical, efficient shovel logging pattern for each unit that accommodates the machinery and its limitations. Be sure to indicate where the shovel will start and end it’s bailing, the direction of movement across the logging unit, and the basic movement of swinging logs so as to end up with them all down at the road.

15% 3. In many states, shovel logging is permitted under wet and rainy conditions whereas other ground-based systems are often curtailed by Forest Practice Rules. Explain how this may be allowed in light of current erosion and stream water quality concerns.

20% 4. How can a system employing an expensive piece of equipment with high maintenance and operating cost that requires the repeated handling of each piece be cost effective? List and briefly discuss four (4) reasons this is an economical system.

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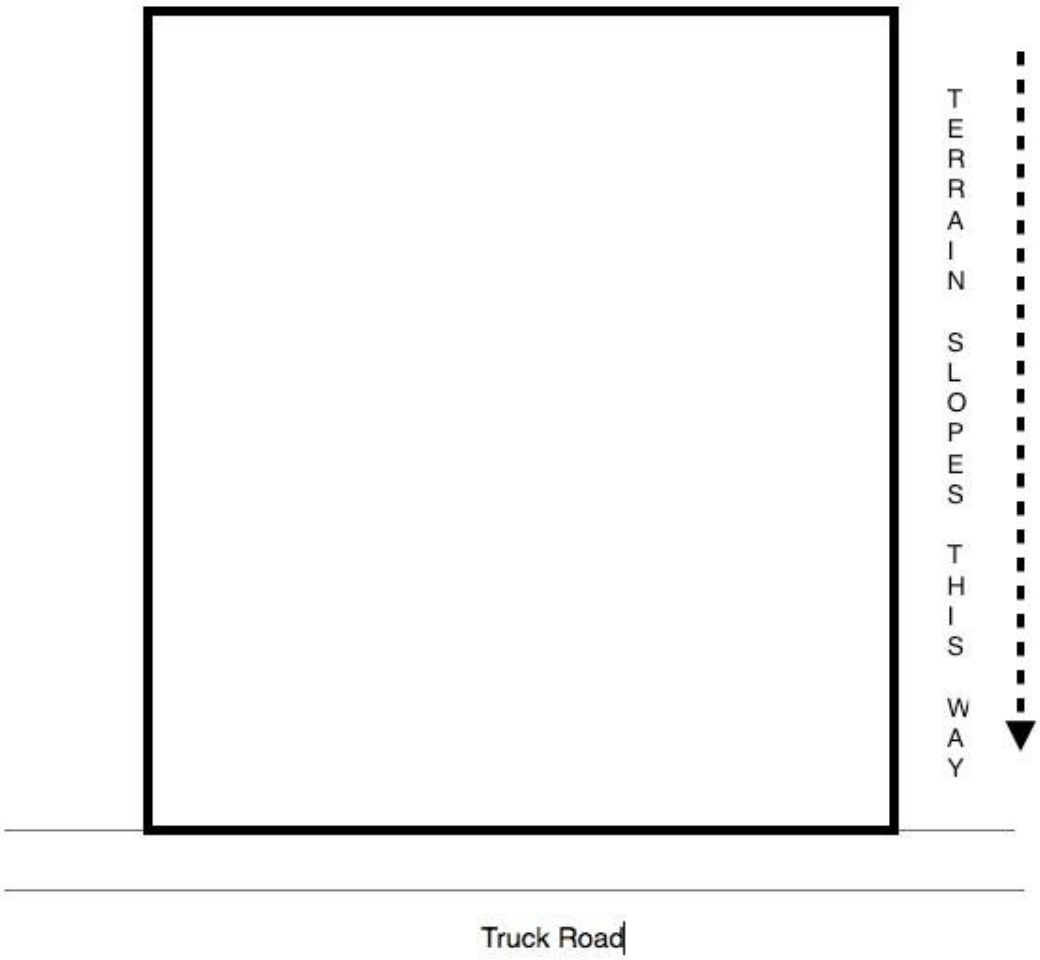

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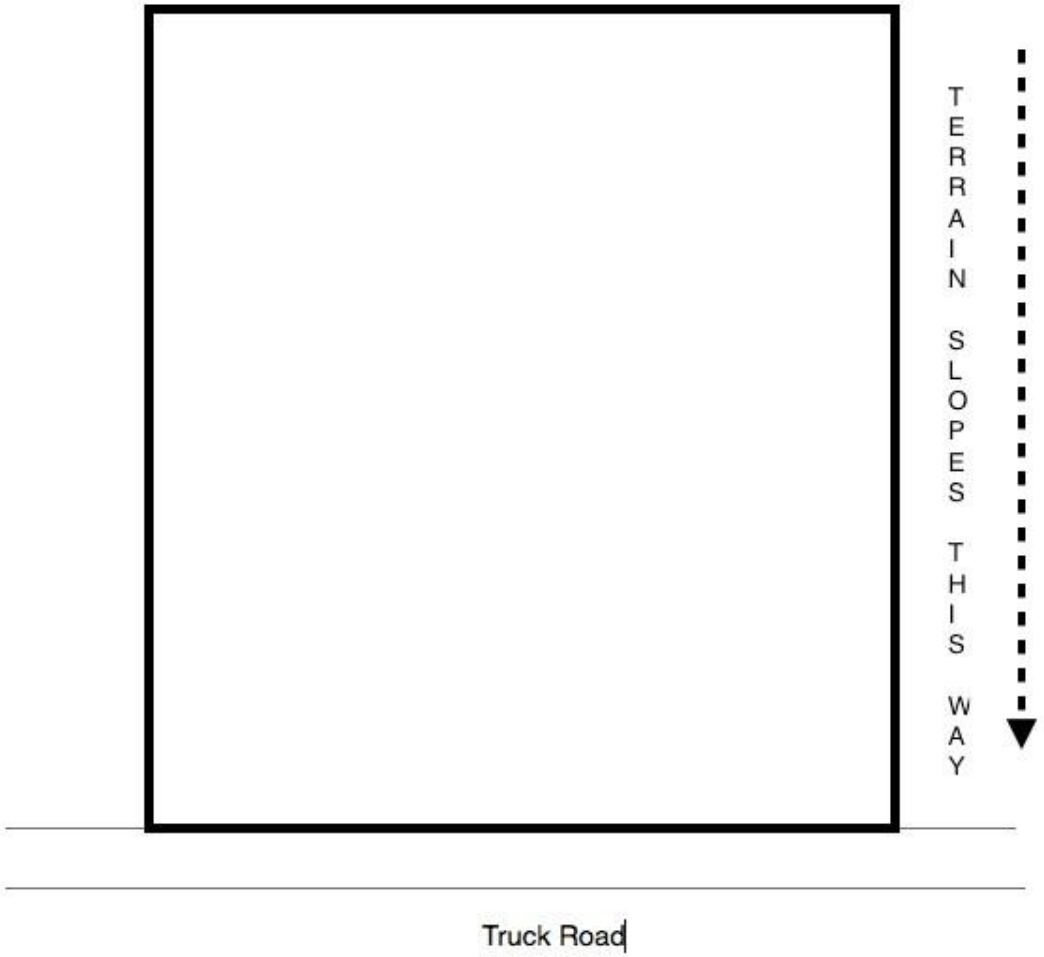
UNIT#B: #STEEPER#TERRAIN# # APPLICANT'S NUMBER= _____



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QUESTION VII-FOREST ECONOMICS

OBJECTIVE:
To demonstrate your ability to explain and use the Present Net Worth (PNW) approach in timberland purchase decisions.

SITUATION
You are the land procurement forester for the Treegrow Timber Company. Mr. Fishcatch, who operates a segment of a nearby stream as a private fishing club, owns several thousand acres of well-forested land surrounding the stream segment to protect water quality and provide a scenic backdrop. Mr. Fishcatch realizes the importance of timber production and, therefore, offers to sell to Treegrow Company a portion of his property if your Company will agree contractually to operate this land under the uneven-aged system.

You are seriously considering Mr. Fishcatch's offer because you have determined, by examining similar lands, that all of the parcels offered by Mr. Fishcatch are suitable for timber production. These parcels look especially attractive since you know that the ideal residual growing stock level for your timberlands is 20,000 b.f./acre, the same as the Fishcatch parcels. You have also previously determined that the addition of only 185 more acres to your existing land base would make it possible to achieve a “regulated forest” for Treegrow Timber. You have developed a fact sheet (which can be found on the page following this question) that you use to answer the following:

QUESTION
15% 1a) Using the Present Net Worth (PNW) approach (formula on fact sheet), which hypothetically ideal cutting cycle length (4, 5, or 6 years) will maximize PNW? Show all of your work on the Computational Table provided below: return this page with your exam.

(Applicants: Please note that the solution to this question is possible without a scientific calculator. See the tools and aids given on the fact sheet.)

Cutting Cycle Length, Yrs.	*Growth/Cut Volume, MBF*	*Forecasted Unit Values for Harvested Timber $/MBF*	*(a) = Net Revenue, $/AC*	*Discounted Net Revenue, $*	*Constant, (c/i)*	*PNW, $*
4	*4.8*				*33.33*	
5	*6.0*				*33.33*	
6	*7.2*				*33.33*	

CONTINUED NEXT PAGE

20% 1b) Explain what the term Present Net Worth means and why it is a valid approach for determining the solution you derived for 1a, above.

What does a PNW value of “0” mean??

10% 2. Briefly discuss which parcels you can feasibly buy based only on PNW.

5% 3. Can you acquire enough acres to economically achieve forest regulation?

5% 4. Explain what budget request you should submit for the purchase of the new lands.

15% 5. Mr. Treegrow (your company owner) does not understand why you used a 6% real interest rate when inflation alone is only 3%. Explain how the effect of inflation is normally handled in PNW calculations.

30% 6. When you present your proposal to Mr. Fishcatch, he questions your management plan. In particular, he feels compelled by the Forest Practice Act to achieve the goal of “maximized sustained production of high quality timber products” (Sec. 4513[b], PRC). Discuss **three (3)** possible interpretations of “maximum sustained production of high quality timber products” and how they pertain to the use of a PNW approach.

.

END OF QUESTION

FACT SHEET ON NEXT PAGE

FACT SHEET FOR DETERMINATION OF PNW OF FISHCATCH PARCELS

Mr. Fishcatch has offered to sell the following parcels to the Treegrow Company at these prices:

Parcel No.	Acres	Current Stocking Level/Acre	Selling Price/Acre Including Value of Current Growing Stock
A	53	20,000 b.f.	$2,400
B	65	20,000 b.f.	$2,500
C	71	20,000 b.f.	$2,600
D	75	20,000 b.f.	$2,700

Assumptions Regarding Mr. Fishcatch's parcels:

Annual growth increment (constant over stocking levels of 20 - 30 mbf; do not compound growth in any computations): 1200 bf/ac/yr
Administration and other annual cost: $ 2.00/ac/yr
Alternative Rate of Return (REAL interest rate or the rate of return that could be earned on an investment in the financial markets with similar risk): 6%
Ideal cutting cycle length: 4, 5 or 6 years
Simplified formula for Present Net Worth (PNW):

PNW = Discounted Net Revenue – Discounted Annual Costs

$$PNW = \left[\frac{a}{(1+i)^n - 1}\right] - \frac{c}{i}$$

Where: a = Net Revenue at end of each cutting cycle
c = Annual costs
i = Real Interest Rate (Discount Rate)

Denominator value for first term in PNW equation (Discounted Net Revenue).

n	(1+i)^n
4	1.2625
5	1.3382
6	1.4185

n =

Forecast Unit Values for Harvesting in Varying Volumes/Acre (Assumes same quality/size of trees at all levels)	
Volume Cut (b.f./acre)	Stumpage ($/mbf)
< 1000	105
1000 - 2000	110
2000 - 3000	120
3000 - 5000	140
> 5000	145

QUESTION VIII- FOREST ADMINISTRATION

OBJECTIVE:
To demonstrate your knowledge about evaluating forest programs requiring monitoring.

SITUATION:
Tens of millions of dollars are invested annually by California forest landowners in habitat restoration-rehabilitation, both terrestrial and aquatic. Well-designed monitoring must be an integral part of any restoration project. Monitoring is technically defined as systematically checking or scrutinizing something for the purpose of collecting specified categories of data. Besides monitoring types and methods, the appropriate scale, both geographical and temporally, must be considered. Assume that you are in charge of an aquatic restoration effort for your ownership to establish sufficient large wood structure (LWS) and to improve salmonid habitat and function. Answer the following questions:

QUESTIONS:
1. Using the assumed project given above, For each of the monitoring types listed below,

42% a) Give a concise definition for each type of monitoring. State the key questions(s) you will try to answer with each type of monitoring.

18% b) Give an example of what might be monitored in this project for each type of monitoring.
I. Baseline Monitoring:

II. Status Monitoring:

III. Trend Monitoring:

IV. Implementation/Compliance Monitoring:

V. Effectiveness Monitoring

VI. Validation Monitoring:

28% 2. Explain how the placement of large wood structure into selected stream locations will improve or impact the following four (4) major restoration-rehabilitation beneficial conditions: Pools, gravel, channel complexity and flow. Limit yourself to direct benefits to salmonids, even though there may be benefits to other biota.

12% 3. Assuming that the addition of large wood structure is needed in the stream locations selected, discuss how past forest and fisheries management have led to this deficit in California (and other western states).

END OF QUESTION

QUESTION IX- FOREST POLICY

OBJECTIVE
To demonstrate your knowledge of policy as it relates to regulation of harvesting of commercial timber on private lands in California.

SITUATION
Assume you are an RPF attempting to explain to an uninformed party how the "public interest" and wildlands are protected under the present California regulatory process.

QUESTION

20% 1. Explain how the provisions of California Environmental Quality Act (CEQA) and the Forest Practice Act are melded to provide a single regulatory process.

20% 2. Discuss the provisions of Section 208 of the Federal Clean Water Act as they relate to harvesting activities on private timberland in California. Include the relationship between Section 208 and the California Forest Practice Rules.

10% 3. Explain the fundamental governmental relationships between the Board of Forestry and Cal Fire.

25% 4. Discuss how the THP Process provides for public discovery, disclosure, review and comment. How does the THP Process provide for protection of resources other than timber?

15% 5. The District Forest Practice rules are segregated into "articles" (categories) relating to standards and practices. List five (5) of these articles and BRIEFLY describe the general intent of each. (Do not use Article 1 - Introduction)

10% 6. List the requirements for obtaining a Registered Professional Forester license and a Licensed Timber Operator license.

END OF QUESTION

QUESTION X- FOREST MANAGEMENT

OBJECTIVE:
To demonstrate your understanding of basic forest management concepts of even age stand growth.

SITUATION:
You must answer these questions with written explanations, definitions and graphs. For the graphical illustrations, please draft them on the graph sheets provided for your use. You may remove them from the examination packet, for ease of use during the examination, but YOU MUST hand in the graph sheets with your written answers. Be sure to place your Applicant's Number in the provided space on the graph sheets. Be sure to adequately label graph axes with titles, units, and/or values to make your graph understandable.

QUESTIONS

1. Assume that you are depicting the following attributes for a well-stocked even-aged young growth stand of Douglas-fir. Further assume that no intermediate stand manipulations will be done.

10% A. On a single graph, depict what the number of trees per acre by diameter class would look like at 40, 80 and 100 years stand age. Explain what is happening in biological terms. Assume there will be no catastrophic losses to fire or pests over that stated ages. (Note-Graders will be looking for a correct answer that is in the "ballpark" as to numbers of trees being depicted and relative changes in number of trees as the stand ages, not exact numbers.)

5% B. What commonly performed stand management treatment attempts to take advantage of the biological behavior you have described in 1A above?

15% C. Depict a graph of total stand volume per acre as a function of stand age.

Define the term total stand volume and explain why your graph behaves in the way you have drawn it.

15% D. On a single graph, depict typical curves for periodic annual growth increment (PAI) per acre and mean annual growth increment (MAI) per acre. Clearly label which curve is PAI and MAI. Define the terms and explain why the curves behave in the way and position you have drawn them.

CONTINUED NEXT PAGE

15% E. Explain and define the concept of culmination of mean annual growth increment and the age that it occurs for a stand.

Does this concept apply to both even-aged and uneven-aged stands? Explain and justify your answer.

20% 2A. Assume that you are interested in expressing the above concepts in relation to useable or net volumes, rather than total volumes. Explain the affect that switching from a total volume basis to a net volume basis would have on the calculation of the age of the culmination of mean annual increment.

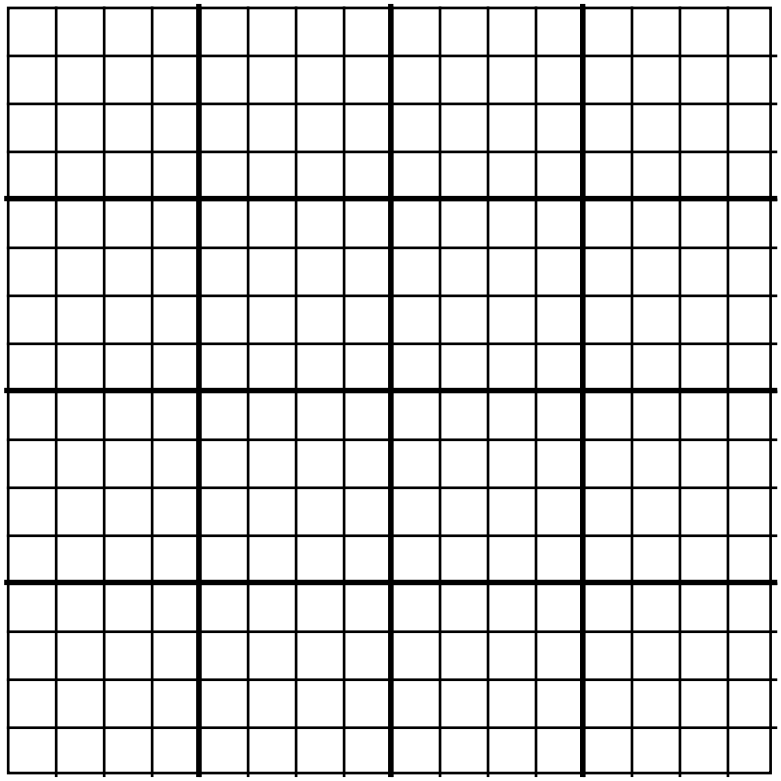
20 % 2B. Assume that your management plans include a change in volume rule from Scribner Board Feet to Cubic Feet or from a minimum top diameter of 8-inches to a minimum top diameter of 4-inches. Explain the affect that switches in utilization standards such as these would have on the calculation of the age of the culmination of mean annual increment.

END OF QUESTION

GRAPH FORMS FOLLOW.

GRAPH FORMS FOR USE WITH MANAGEMENT QUESTION APPLICANT NUMBER _____

GRAPH FOR QUESTION 1A & B



HAND IN WITH ANSWERS AND EXAM

GRAPH FORMS FOR USE WITH MANAGEMENT QUESTION APPLICANT NUMBER

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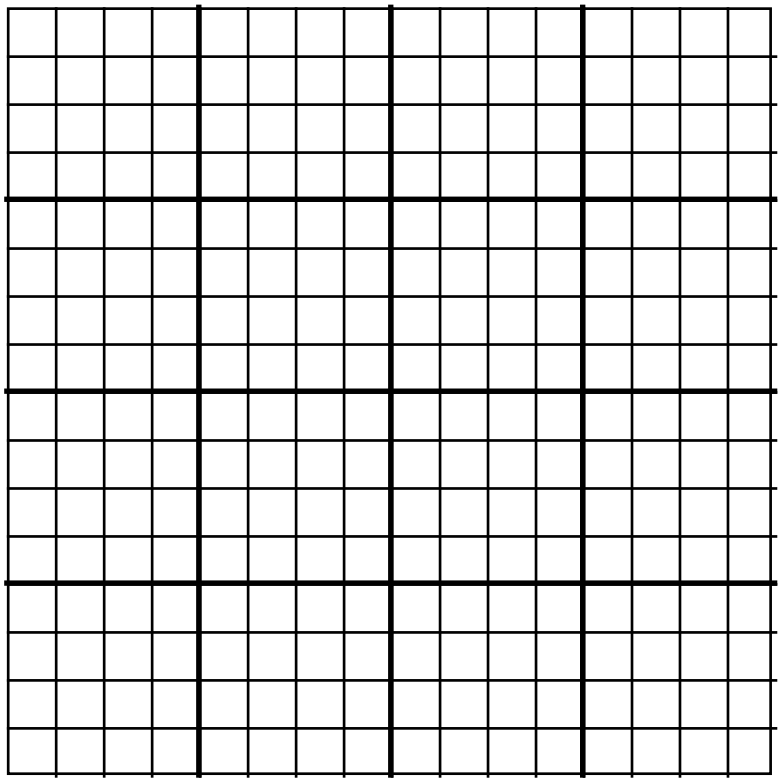
GRAPH FOR QUESTION 1C



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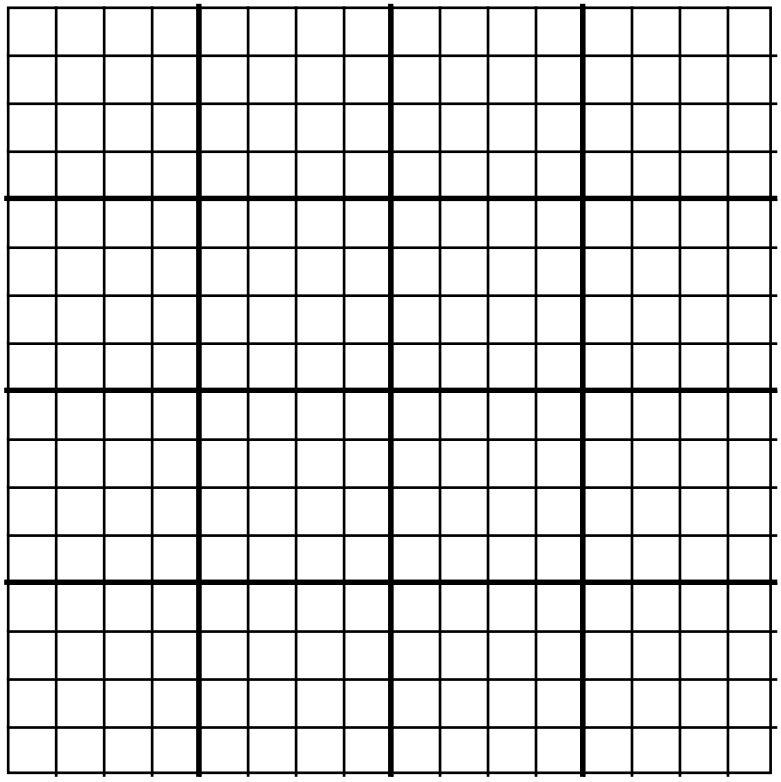
GRAPH FORMS FOR USE WITH MANAGEMENT QUESTION APPLICANT NUMBER _____

GRAPH FOR QUESTION 1D



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END OF EXAM